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PROGRESS AND PLANS FOR BONNEVILLE SALT FLATS STUDY
November 3, 1992

DIVISION OF
OIL GAS & MINING

Progress:

Mass water-level measurements were made on wells in the Bonneville Salt Flats and Pilot Valley during July. These values have been entered into a spreadsheet program and corrected for density.

Five additional observation wells were drilled to a depth of 63 feet. Water-level measurements from these wells will be used to determine vertical hydraulic gradients between the shallow-brine aquifer and the underlying basin-fill aquifer. Nineteen additional shallow observation wells were installed east of the collection ditch, in two north-south lines in the vicinity of Interstate 80, and in the vicinity of the access road, west of the salt crust.

Water samples were collected from 46 shallow wells and nested piezometers and were submitted for major-ion analysis including bromide, boron, lithium, and strontium. Of these 46 samples, 17 were submitted for oxygen and deuterium stable-isotope analysis and 6 were submitted for tritium analysis. At this point in time, not all of the analyses have been completed.

Pore fluids have been extracted from cores collected beneath the salt crust at four sites. Analysis of pore fluids indicates a uniform brine-chemistry profile exists in the cores. Therefore, the use of Br/Cl profiles does not appear to be useful for the determination of dissolution/precipitation processes at the bottom of the salt crust. Additional cores have been collected at four locations on the salt crust in order to verify this uniformity of brine chemistry in pore fluids.

Coring of the salt crust was somewhat more successful. Mostly complete sections of the salt crust were obtained from three locations. If these cores are of suitable quality, fluid inclusions and salt mineralogy will be examined by Tim Lowenstein at the State University of New York, Binghamton, New York.

A simplified "box" model has been developed for the shallow-brine aquifer for the purpose of testing salt-balance estimates made by Lines and probable boundary conditions that might be used in the more detailed areal model to be developed. An additional cross-sectional model has been developed along the north line of wells to test velocity and density distributions. More explanation and results will be presented by Ken Kipp at the meeting.

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Plans for the future:

Measure water levels at a point in time during the winter months when conditions are favorable.

When consistent elevation control has been established, water-level data will be plotted and potentiometric surfaces will be contoured for each set of data.

Continue monitoring pump on ditch from federal leases. Make additional discharge measurements.

Collect water samples from the five new observation wells completed in the basin-fill aquifer. Samples will be analysed for major-ion chemistry and oxygen and deuterium isotopes.

Make geochemical interpretations of data data from wells and pore fluids as complete data sets are available. Contour percent concentrations of potassium and magnesium and compare to Lines' data.

Continue sensitivity testing of simplified models. Begin development of detailed areal model.